

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-323937

(43)Date of publication of application : 25.11.1994

(51)Int.Cl.

G01N 21/78  
G01N 21/22  
G01N 21/493  
G01N 21/22

(21)Application number : 05-112777

(71)Applicant : TERUMO CORP

(22)Date of filing : 14.05.1992

(72)Inventor : TANIZAWA KAZUHIKO

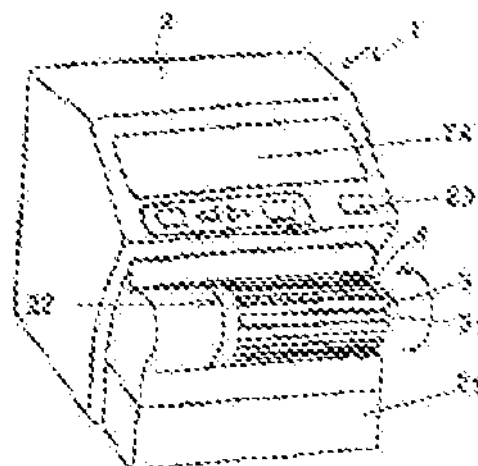
(54) ANALYZER

(57)Abstract:

**PURPOSE:** To continuously make possible the measurement and discharge of test tools and continue reduction of a working time by rotating a tray and moving the test tools set at a mounting part at an exposed location up to a measurement part and a discharge part of a device body.

**CONSTITUTION:** A tray 3 is rotated in an arrow direction when a switch 23 is operated. Test tools 4 are mounted on a mounting part 31 placed at an instructed position 22 one by one when stop is performed for about 6 seconds with a stop means once. The measurement is performed with a measurement part in turn from the forefront tool as the stop is performed for about 6 seconds once.

Furthermore, the tray 3 is rotated, so that a discharge guide provided at the connection end of the tray of the device body 2 is fitted in the ends of the test tools 4, which are successively scrapped in a scrap box 21. A measurement result of an object to be measured adhering to the test tools 4 is shown on a display 24. The operation is repeated for the purpose of measuring a number of the test tools 4 in a short time.









[1341]



[1351]



## \*NOTICES\*

JPO and JPPTI are not responsible for any  
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the device for conducting detection analysis of grape sugar, protein, etc. in the specific component in a sample, for example, urine.

[0002]

[Description of the Prior Art] In conducting measurement analysis of the sample ingredient of the former, for example, urine, a test tool is made immersed into urine and coloration of the test layer is carried out, and by the analysis apparatus, the coloration intensity is measured and it is analyzing each sample ingredient. On the other hand, the analysis apparatus has a device main frame having the optical measuring unit for generally measuring coloration intensity, and a tray which lays a test tool.

Said tray lays a test tool out of a device main frame, and has the structure of conveying said test tool to the measuring point in a device main frame.

[0003] However, since these needed a complicated device, the main part was large, and a maintenance and cleaning were complicated [ in order that the device which inspects a sample continuously might carry the test tool etc. to which the sample or the sample adhered to a test section, the tray of a sliding type or the shape of a conveyor was generally used but ].

[0004]

[Problem(s) to be Solved by the Invention] The purpose of this invention is to provide the analysis apparatus which cancels the fault of the conventional technology mentioned above and can analyze a sample.

[0005]

[Means for Solving the Problem] The above-mentioned purpose is attained by this invention shown below.

[0006]In an analysis apparatus which this invention has a tray which lays a test tool which has a reagent layer which contacts a sample and carries out coloration, and said test tool discharge part, and has a test section which measures coloration intensity of said reagent layer optically in a device main frame. Said tray consists of solids of revolution, and a placing part of said test tool is provided in the surface of said solid of revolution. And in order for said some of trays to lay said test tool, it is protruded from a device main frame, or is opened wide. It is an analysis apparatus, wherein said test tool set to said placing part in said exposed position is moved to a test section in a device main frame, and a discharge part by rotating said tray.

[0007]A tray consists of solids of revolution in this invention, and although the shape in particular is not limited and especially its cylinder body is preferred, a polyhedron etc. can be used for others. Since it is possible to make it discharge by a natural fall by weight of a test tool as for especially a placing means of a placing part of a test tool also when providing a concave which is not limited and fits into a test tool discharges a test tool, it is the most desirable, but a means of fixing across both ends of a test tool can also be used. Although it is most preferred for a pivot means in particular of a solid of revolution not to be limited, either, and to make it rotate by a small motor which can operate with an accumulation-of-electricity background which can be installed in an analysis apparatus main part, a means rotated manually is also feasible.

[0008]By letting to a placing part of a tray a test tool which adhered a sample in a position to which a tray was exposed from a device main frame, and rotating a tray, an analysis apparatus of this invention conveys a test tool to a test section possessing a measuring device of a test tool in a device main frame, and measures a sample. A test tool which conveyed a test tool to a discharge part provided in the main frame from a test section, and measurement ended can be discharged by furthermore rotating a tray.

[0009]While a tray is rotating in this invention, when a position and/or a test tool which lay a test tool reach a test section. For example, more exact measurement will be attained, if a means to rotate a tray is an electric motor and a halt means of stopping rotation of a tray for several seconds by making the power transmission halt will be formed. Under the present circumstances, when there is a placing part in the specified position, if it is made for other placing parts to be in a test section, work effectiveness will improve width of a test tool placing part.

[0010]In this invention, the number in particular of placing parts is not limited, and it is usable in the singular number, and if two or more placing parts are provided and it places them in measuring a sample continuously, by rotating a tray, it is possible to measure many test tools continuously, and working hours can also be shortened from the conventional thing.

[0011]In this invention, by a discharge part, a used test tool is discharged and it is

automatically stored in an abandonment box. A saculate thing of \*\*\*\*, such as a thing of core boxes, such as a plastic and metal, paper, and a film, is also possible for an abandonment box. An abandonment box is possible also for a disposable thing, and can be discarded with a used test tool stored at that time.

[0012]

[Example]Hereafter, an example is shown and this invention is explained still in detail.

[0013]Drawing 1 is a transverse-plane perspective view of the analysis apparatus 1. The test section 25 and the indicator 24 are built in in the device main frame 2 of the analysis apparatus 1. In the device main frame 2, the tray 3 and the abandonment box 21 possess, and the tray has the placing part 31 on the surface

[0014]The test tool 4 which immersed the sample in the hollow of the placing part 31 of the tray 3 specified by the specified position 22 of the main frame 2 is made to fit in. The test tool 4 which fits into the tray 3 comprises the strip-of-paper-like base material 40 and the reagent layer 41 arranged on it by regular intervals from the end of the base material 40, as shown in drawing 2. And the reagent layer 41 is not arranged but the other end of the base material 40 is a handle part. The test tool 4 of this example is targeting urine as a sample. As construction material of the base material 40, and polystyrene, polyethylene terephthalate, Plastics, such as polyvinyl chloride, polyvinyl acetate, polypropylene, and celluloid, The construction material which has a certain amount of elasticity, such as ceramics, paper, and metal, is used, and the reagent which reacts to grape sugar in urine, bilirubin, protein, etc., respectively, and carries out coloration as each reagent layer 41 is used respectively

[0015]Although the light from a light source is reflected by the reagent layer 41 and the method of measuring the catoptric light is used by this example as a method of measuring the coloration intensity of the reagent layer 41 of the above test tools 4, it is also possible to use other methods. It consists of a light source which specifically applies light to the angle of 45 degrees to the reagent layer 41, and a light sensing portion provided right-angled to the 41st page of the reagent layer, the reflected light intensity of the reagent layer 41 which the light sensing portion received is based, and the coloration intensity of the reagent layer 41 is judged.

[0016]The tray 3 is attached to the device main frame 2 as shown in drawing 1. In the device main frame 2, it has a means to rotate the tray 3, and has an electric motor which operates by a storage battery in the device main frame 2 on the longitudinal direction extension axis of the tray 3 in this example. Said electric motor is operated by the switch 23. When the specified position 22 and the test tool 4 are located in the test section 25 in the tray 3, a means to make power transmission on a motor interrupt automatically, and to make for several seconds stop is formed in the device main frame 2.

[0017]The switch's 23 operation of the tray 3 will rotate it to an arrow direction, as shown in



drawing 3 of a sectional view. Although the tray 2 rotates, when it stops for about 5 seconds by a stop means, the one test tool 4 after another is laid in the placing part 31 located in the directions position 22. Next, it is measured by the test section 25, stopping for about 5 seconds by a stop means sequentially from the test tool 4 of the head of a hand of cut, as shown in drawing 4. When the tray 3 rotates, the discharge guide 26 provided in the tray connecting end of the device main frame 2 hooks the end of the test tool 4, and is discarded one by one by the abandonment box 24 in the test tool 4. The measurement result of the sample adhering to the test tool 4 is displayed on the indicator 24. By repeating the above operation, it is possible to measure many test tools 4 for a short time. By removing from the device main frame 2 after the end of work, the tray 3 is cleaned easily, and the used test tool 4 removes the abandonment box 24 from a body container, and it can discard it easily.

{0018}

[Effect of the invention] Since the analysis apparatus of this invention can perform measurement and discharge of a test tool continuously, shortening of working hours of it is attained, and simplification of a device and small space-ization of it are attained, as it mentioned above. It came to be able to perform maintenance and cleaning easily by removing a tray.

---

{Translation done.}